STATE OF MINNESOTA
COUNTY OF RAMSEY
- -
THE STATE OF MINNESOTA,
BY HUBERT H. HUMPHREY, III,
ITS ATTORNEY GENERAL,
and
BLUE CROSS AND BLUE SHEILD
OF MINNESOTA
Plaintiffs,
-vs- Case File No. C1-94-8565
PHILIP MORRIS INCORPORATED,
R.J. REYNOLDS TOBACCO COMPANY,
BROWN & WILLIAMSON TOBACCO CORPORATION,
B.A.T. INDUSTRIES P.L.C.,
BRITISH-AMERICAN TOBACCO COMPANY LIMITED,
BAT (U.K. & EXPORT) LIMITED,
LORILLARD TOBACCO COMPANY,
THE AMERICAN TOBACCO COMPANY,
LIGGETT GROUP, INC.,
THE COUNCIL FOR TOBACCO RESEARCH - U.S.A.,
INC., AND THE TOBACCO INSTITUTE, INC.
Defendants
- -
DEPOSITION OF LIGGETT GROUP (DENNIS D. DIETZ)
STIREWALT & ASSOCIATES
P.O. BOX 18188, MINNEAPOLIS, MN 55418 1-800-553-1953

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(The following is the deposition of Liggett Group (DENNIS D. DIETZ), taken pursuant to the Second Amended Notice of Taking Deposition, at the offices of Dorsey & Whitney, 250 Park Avenue, 16th Floor, New York, New York, commencing at approximately 8:30 o'clock p.m., September 29, 1997.)

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On Behalf of the Witness and Liggett Group:

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DENNIS D. DIETZ

having been first duly sworn by the Court Reporter, was examined and testified as follows:

CROSS EXAMINATION

BY MR. GORDON:

Q. Good morning. Could you state your full name for the record, please.

A. Yes. Dennis Donnelly Dietz.

Q. And you are a Ph.D.; is that correct?

A. That's correct.

Q. I'm going to refer to you as Dr. Dietz, if that's okay with you.

A. That's fine.

Q. Dr. Dietz, my name is Corey Gordon. I'm an attorney from the Twin Cities, and I represent the State of Minnesota and Blue Cross/Blue Shield in a case now pending in the state court of Minnesota in Ramsey County, State of Minnesota and Blue Cross/Blue Shield versus Philip Morris, et al., including the Liggett Group.

Have you ever had your deposition taken before?

A. Yes.

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Q. When was that?
A. I believe in 1994. It was a couple of years ago in Washington.
Q. Was that in connection with your employment with Liggett?
A. Yes.
Q. Who -- what was that deposition about?
A. It was with the Department of Justice regarding, I guess, ignition propensity issue.
Q. When you say "ignition propensity," would that refer what we might call in shorthand the fire-safe cigarette?
A. The fire-safe cigarette; correct.
Q. You have not had your deposition taken in connection with any smoking and health issues; is that correct?
A. That's correct.
Q. In terms of the deposition process, it's probably, I would assume, the same.
I'm going to ask you questions, you'll give answers. The Court Reporter will take the answers down.
In this case, there's also a

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videotape that's taping you.

You understand that the testimony you give today will be played to a jury in Minnesota at the time of trial; correct?

A. I understand.

Q. And because I'm asking questions and you're giving answers and the Court Reporter is taking this down, we have to make sure that -- first of all, that I wait until you're done with your answers before I begin my next question.

A. Uh-huh.

Q. You, in turn, have to wait until I'm done with my questions before you begin the answer.

Sometimes, your attorney might make objections for the record, and we both have to wait while he does that. Sometimes, some of the other lawyers might have things to interject in the record.

Just for the Court Reporter's sake, we have to be very careful we don't talk over each other.

And one other rule is that when you give an answer, it has to be a verbal answer as in yes or no, as opposed to a nod or shake of the

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head; okay?
A. Okay.
Q. And you understand that today, you are appearing as a spokesperson for the Liggett Group; is that correct?
A. That's my understanding, correct.
Q. You are employed by -- by Liggett; is that correct?
A. That's correct.
Q. What's the correct corporate name?
A. Liggett Group, Incorporated, as far as I know.
Q. And it used to be called "Liggett & Myers"?
A. That's correct, uh-huh.
Q. What is your position with -- well, strike that.
For shorthand, if I refer to "Liggett," that will mean Liggett Group, Incorporated, your employer; is that okay?
A. We refer to it in many ways, so "Liggett" is fine, uh-huh.
Q. Okay. What is your -- I'm sorry.
What is your current position with Liggett?

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A. Manager of scientific issues.
Q. And how long have you had that position?
A. Since I started Liggett.
Q. And when was that?
A. Nineteen ninety.
Q. Let me back up a little bit and get your educational background.
First of all, where did you go to college?
A. Three universities; University of Cincinnati, Michigan State and University of Michigan.
Q. And you're graduated from the University of Michigan?
A. That's correct, most recent.
Q. Okay. Why don't you give me your undergraduate degrees?
A. Undergraduate, B.A. at University of Cincinnati. I believe it was '64.
Q. What was that in?
A. Chemistry.
Q. Okay.
A. Master of Science -- no, Master of Art at Michigan State, '69.

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Q. Also chemistry?
A. No, that was a combination, education/zoology, and then University of Michigan, 1976, Ph.D., toxicology.
Q. So, you are a toxicologist; is that correct?
A. Correct.
Q. What is toxicology?
A. It's the study of the adverse effects of chemicals on organisms, including man.
Q. Following your graduation from the University of Michigan in 1976, what was your first employment?
A. I did a post-doc.
Q. Where was that?
A. University of North Carolina.
Q. And what was that in?
A. I was doing behavioral pharmacology-type work, behavioral toxicology.
Q. Could you tell the jury what "behavioral pharmacology" and "behavioral toxicology" refers to?
A. Well, it's the study of -- of behavior and the effect -- and the underpinnings of that behavior, whether it be pharmacologic or

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toxic, or whatever.

In my case, I was looking more at the toxicology side of it.

Q. Again, so that the jury has an understanding, when you use the word "pharmacology," in layman's terms, would that be drugs?

A. Correct. I was -- I was in a pharmacology department, but I was studying primarily toxicants; lead, kepone. I wasn't really studying pharmacologications, but there was -- there were those kinds of studies going on.

Q. Did your work at that point at the University of North Carolina have anything to do with cigarettes or tobacco?

A. No.

Q. Okay. How long did you do the post-doc?

A. About two to three years. I can't be exact.

Q. Okay. What was your next work activity?

A. Wisconsin, Madison, a contract lab.

Q. What kind of work were you doing in Madison?

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A. I was working for -- at the time, it was called "Raltech," and I was a study director for cancer bioassays -- cancer bioassays and a variety of shorter-term studies.

Q. What kind of business was Raltech in?

A. Well, we were a contract lab. It's currently -- it's gone through several changes. It was called "Hazelton" at one time, but they were studying primarily rodents, some monkeys studies and a variety of studies for industrial -- a variety of clients -- government clients, testing for various toxicology-type studies, whether it be chronic, subchronic, acute, a variety -- actually, even, they were doing genetic toxicology testing.

Q. Did any of your work while you were at Raltech involve tobacco or cigarettes?

A. No.

Q. Was any tobacco or cigarette work going on at Raltech during the period of time that you were employed there?

A. Not to my knowledge, no.

Q. At any point in time, have you ever become aware that Hazelton had been involved in

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doing toxicology studies for some of the cigarette industry?

A. No.

MR. MARKS: Objection to the form.

BY MR. GORDON:

Q. Okay. Tell the jury what is meant by a "cancer bioassay."

A. Well, it's basically lifetime studies, and most of them are feeding or gavage force-feeding type studies. It could be a variety of routes of exposure, but it's exposing animals in a dose stepwise fashion over a lifetime and then doing an analysis to see whether tumors develop over those -- over those times.

Q. To put it in perhaps fairly simplistic terms, is a cancer bioassay a test to determine if a particular substance has the ability to produce cancer or not?

A. That's correct.

Q. Okay. How long were you at Raltech?

A. Approximately -- two and a half to three years. I can't recall exactly.

Q. We are up to about '83/'84; is that right?

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A. Somewhere in that area, uh-huh.
Q. Okay.
A. I think -- well, actually, I left there -- I have to think back on this.
I think up to '81.
Q. Okay. What was your next position?
A. Tracor Jitco in Research Triangle Park.
Q. Where is Research Triangle Park?
A. North Carolina.
Q. And what was the work you were doing there?
A. I was operations coordinator on NCI cancer bioassays.
Q. "NCI" is National Cancer Institute?
A. Right, uh-huh. We were a contractor for the NCI.
Q. The NCI is a federal government agency?
A. Right, uh-huh.
Q. You were doing similar sorts of cancer bioassays similar to what you were doing at Raltech; is that right?
A. Well, not really. At Raltech, I was a hands-on study director, going in the rooms,

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observing animals, had people that reported to me, day-to-day activities in the laboratory.

When I was with Tracor Jitco, we were managing contracts at other laboratories, and so we were -- we had a pathologist, a toxicologist, statisticians, and we would receive information and then review that. It was more of a programatic kind of approach, as opposed to hands-on.

Q. When you were at Tracor Jitco, did you have anything to do with tobacco or cigarettes?

A. No.

Q. How long were you there?

A. Until they went out of business, at least until they lost the contract, about a year and a half or so.

Q. Up to '83 or so?

A. Somewhere in that area, right.

Q. Okay. What was your next position?

A. Research Triangle Institute.

Q. Still in North Carolina?

A. Right, uh-huh.

Q. What kind of work were you doing there?

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A. I was staff toxicologist there doing primarily -- trying to write -- write proposals to get contracts with the NCI, and they were more chemo-preventative in approach.

Q. Chemo-preventative, did you say?

A. Correct.

Q. What does that mean?

A. Well, natural constituents that can be used to circumvent animal models for cancer, such as vitamin A, selenium, these kinds of things.

We never did those studies, but I was trying to get RTI in position where they could do those studies, so I was writing a variety of proposals, and we did get a master agreement, but we never actually got the work while I was there.

I did do some other work that I was more directly involved with, and that was what they call UDS, unscheduled DNA synthesis, which is more of a DNA repair-type assay using hepatocytes from rats, so I was doing a variety of things, but I think my primary reason for being there was to try to get us, or that is, RTI on board for these chemo-preventative studies.

Q. And did your work at the

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Research Triangle Institute involve anything to do with tobacco research or studies?

A. No.

Q. How long were you there?

A. Roughly -- well, three years almost to the day.

Q. Until roughly 198 -- excuse me -- 1986?

A. Yes, about that time.

Q. And where did you go then?

A. I was offered a position to go to the national toxicology program, and they were really -- it was sort of -- like going back to my old Tracor Jitco-type studies, because they had taken over that program and they wanted me to come back and work with them, and so I accepted that, and it was a government position.

Q. Was that through the National Cancer Institute?

A. Well, the national toxicology program is interagency. It involves FDA, NIOSH, NCI and NIEHS, but I was employed by NIEHS, which is National Institute of Environmental Health Sciences.

Q. Any of this work involve cigarettes

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or tobacco?
A. No.
Q. Okay. How long were you with the national toxicology program?
A. Approximately, four years.
Q. Does that bring us up to Liggett?
A. Right.
Q. Okay. So, your work with Liggett was the first time in your professional career that you worked with a tobacco company?
A. Correct.
Q. Okay. How did you first hear about the position at Liggett?
A. Somebody at NTP -- I think it was Ron Melnick -- mentioned that he had been in contact with a so-called headhunter, and that there was a position available in Durham that would offer a good opportunity and I should maybe talk with him.
Q. What was the nature of your initial employment?
In other words, what were you hired to do?
A. Well, oversee ingredients, primarily look over a variety of issues, including

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ignition propensity, attend meetings where pesticide residues were discussed, in general, just to oversee the health and -- health issues that were going on at the time -- still going on.

Q. With respect to Liggett cigarettes; correct?

A. Correct.

Q. Does Liggett have any other tobacco products besides cigarettes?

A. No, not currently.

Q. Did it ever?

A. It's my understanding that they did at one time.

Q. Before your time?

A. Right, uh-huh.

Q. So, for the entire time that you have been there, the only tobacco product of Liggett has been cigarettes?

A. We have been solely a cigarette company since I have been there.

Q. What are the cigarette brands of Liggett currently?

A. Well, the ones that are known are Chesterfield, L&M, Eve and Lark. Those are the three main -- or four main ones, and then there's

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Pyramid, and then we're involved or have been involved extensively in the generic area.

Q. That's private brands?

A. Store brands, private brands, uh-huh.

Q. How long has Liggett been in the cigarette business?

A. Oh, gee, I don't know -- a long time. I can't trace the history of it, but I know I started noting -- looking through things that were back in the '50s, and I'm sure it was well before then.

Q. Is it your understanding Liggett is one of the oldest cigarette companies in the country?

A. That's correct.

Q. Cigarettes contain tobacco; correct?

A. Correct.

Q. And I realize this is a fairly simplistic question, but tobacco naturally contains nicotine; correct?

A. Correct.

Q. Why is there nicotine in a plant? What function does it serve in the tobacco plant itself?

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A. Well, I don't know if I can answer that question. It would be hypothetical. I have had ideas, but I don't know specifically the answer to that question.

Q. Well, let me perhaps ask it a different way.

Does nicotine in the tobacco plant itself serve as a natural insecticide?

A. That's what I think it does, but whether it -- that's the -- that would be my guess, but that's more for somebody in the botanical/agricultural area to really put their expertise on, and I think I've heard comments to that effect.

Q. Nicotine chemically can exist in what's referred to as either the proteinated or unproteinated state; is that correct?

A. Correct.

Q. Explain to the jury what the difference is between proteinated and unproteinated.

A. Well, "proteinated" is -- basically in the case of nicotine, it's a hydrogen ion, and as I understand it, you can have a monoproteinated with one hydrogen ion there, so you have a

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plus-one charge, or you can have diproteinated, which is two hydrogen ions, you'll have a plus-two charge, or you can have the so-called unproteinated, sometimes called freebase with no charge.

Q. And in the tobacco itself, how does nicotine exist --

MR. MARKS: Objection to form.

BY MR. GORDON:

Q. -- in terms of the mono, di or unproteinated state?

A. I think primarily in the salt form, which would be in one of the proteinated forms, but it could be -- exist in a variety of forms.

Q. So, salt form is another term of -- that would refer to the mono or diproteinated form; is that correct?

A. Correct.

Q. Okay. So, salt form is the other form from freebase form; is that correct?

A. The salt would be implied that there's an anion, along with the cation, the cation being the plus charge. There's usually like -- it could be malate, sulfate, chloride, different negative components to -- and so the

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salt is the combined constituent.
Q. Okay. When tobacco in a cigarette is burned, it releases nicotine; is that correct?
A. Correct.
Q. And that nicotine goes into both a particulate phase and a gas phase; is that correct?
A. That's my understanding, uh-huh.
Q. Can the freebase form -- strike that.
Is it correct that the freebase form is only in the -- no, strike that.
The salt form of nicotine, when it's burned in a cigarette, that is -- is it correct that that only goes into the particulate phase?
A. I don't know if I can answer that question. Really, a lot of those things are kind of -- I just went to the TCRC, and those -- that's the Tobacco Industry Research Conference -- and I think they are still investigating that, so a study I saw would indicate that if you get temperatures high enough, you might get all freebase.
Q. In terms of a cigarette rod, there will be temperatures of varying degrees all

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throughout the rod as the cone burns down; right?
A. Uh-huh.
Q. You have to answer yes or no.
A. Yes, uh-huh.
Q. Okay. So, in some parts of the cigarette, it will be a very high temperature, and other parts of the cigarette, it will be considerably lower temperature?
A. That's correct, uh-huh.
Q. In terms of the difference though between freebase and salt form of nicotine as it occurs in the smoke that comes off of a cigarette, at this point, you don't know as between particulate and gas phase where freebase versus salt form would show up?
MR. MARKS: Objection to the form.
A. I have not done those kinds of studies, but I would be reluctant to say definitively. I believe most of the nicotine is in the particulate, but it does go between both phases, and exactly what's freebase and salt, I don't know.
Q. Okay. What is pH?
A. PH is a measure of acid base.
Q. And does that have anything to do

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with whether nicotine is in the salt form or the freebase form?
A. Yes.
Q. How does that work; what relates to what?
A. Well, the acid would keep it in more of a salt form, if you will, and the base would convert it to the freebase form.
Q. And the pH scale is a numerical scale; is that correct?
A. That's correct.
Q. One to fourteen?
A. That's correct, uh-huh.
Q. And seven is neutral?
A. Seven is neutral.
Q. Neither acid nor base; correct?
A. That's right.
Q. And if it's below seven, that's acidic, and above seven, that's basic; is that correct?
A. That's correct.
Q. Okay. So, if nicotine is in a pH that's below seven, it's going to be primarily in the salt form; is that correct?
A. Primarily, uh-huh.

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Q. And as you -- strike that.
As the pH goes higher and higher, more of the nicotine becomes freebase; is that correct?
A. That's correct.
Q. Okay. And this is something that Liggett has studied for a number of years; correct --
MR. VAUGHAN: Object to the form.
BY MR. GORDON:
Q. -- the issue of -- the relationship between pH to nicotine?
MR. DIESETH: Objection.
A. No.
MR. GORDON: Let me have a document marked, if I may.
A. We have studied it, but not for a number of years. That would be -- well --
MR. GORDON: Okay. We'll see if he can define it a little bit.
(Plaintiffs' Exhibit 1335 was marked for identification.)
THE COURT REPORTER: Thirteen thirty-five.
BY MR. GORDON:

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Q. Dr. Dietz, I'm showing you what's been marked as Exhibit 1335, a two-page document produced by Liggett in discovery bearing Bates number LG 0262125 through 2126.

I believe that the pages were stapled out of order and that the second page of this document bearing the higher Bates number is actually page 1.

A. Okay.

Q. And the first page of the document, I think, is page 2. That might make it more -- easier for you to figure out this document.

A. Okay.

Q. This is an internal Liggett research document; is that correct?

A. It appears to be, uh-huh.

Q. And it's from 1971, is that --

A. That's correct, uh-huh.

Q. And the subject of this is "The development of a cigarette with increased smoke pH"; is that correct?

A. That's correct.

Q. And in this particular document, the summary indicates that "Liggett research demonstrated that increasing the pH of the medium

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in which nicotine is delivered increases the physiological effect of the nicotine by increasing the ratio of freebase to acid salt form"?

A. Uh-huh.

Q. Is that right?

A. That's what's stated.

Q. And I want to kind of take that sentence apart a little bit.

That -- going back to what we were talking about before when it's talking about the pH there, we're talking about the acid base balance; right?

A. Yes.

Q. And what this is saying, what Liggett researchers determined in 1971, that as you raise the pH of whatever the medium in which nicotine is delivered, that increases the amount of freebase relative to --

MR. MARKS: Objection to the form.

MR. DIESETH: Objection.

BY MR. GORDON:

Q. Let me finish the question -- relative to the acid form of nicotine; correct?

MR. DIESETH: Objection.

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MR. MARKS: Objection to the form.
A. I got distracted.
BY MR. GORDON:
Q. Me, too. Let's try it again.
A. Okay.
Q. In 1971, Liggett, the Liggett research department determined that increasing the pH of whatever the medium nicotine is delivered in increases the ratio of the amount of freebase nicotine relative to the amount of the salt form of nicotine; correct?
MR. DIESETH: Objection.
MR. MARKS: Objection.
A. I would say, it's my understanding that Liggett looked at pH. They didn't look at the actual forms, so it would theoretically do that according to theory, but I don't think they measured the actual freebase versus proteinated monoproteinated. They measured pH.
Q. And pH is a measurement of the amount of hydrogen ions in a particular solution; is that right?
A. That's correct.
Q. So, the theory is that if you're in a basic range of pH, that there will be more

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freebase nicotine than if it's in an acidic range of pH; right?
A. In theory.
Q. Okay.
A. But they didn't actually measure the actual mono, di and freebase forms.
Q. They were measuring for pH?
A. For pH, uh-huh.
Q. And the theory that Liggett was exploring in this research was whether increasing the pH would increase the physiological effect of nicotine; is that right?
MR. MARKS: Objection to form.
MR. DIESETH: Object.
A. It's my understanding that Liggett did not do physiologic studies, but this was a hypothesis.
BY MR. GORDON:
Q. When this refers to the physiological effect of the nicotine --
A. Uh-huh.
Q. -- what is your understanding of what that refers to?
A. Well, I think -- I wasn't there at the time, so it's -- I have to just conjecture on

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that, but I think from reading the literature, they hypothesized that it would increase the physiological effect.

Q. Just in general terms, what do we mean when we talk about the physiological effect?

A. Well, nicotine is known to affect cardiovascular function, mental acuity, and so on, EEG, and these kinds of things.

Q. EEG is electroencephalogram?

A. Right, uh-huh.

Q. That's a measure of brain-wave activity?

A. Right, uh-huh.

Q. So, when we talk about nicotine's physiological effects, we're talking about its effects on the human body, basically?

A. Correct.

Q. And that would include both the heart, the cardiovascular system and the brain?

A. Right, but I must say, again, it's conjecture, but I think in those days, at least this group, from having talked to some people who were involved earlier on, that they interpreted physiological effect like mouth, feel, this so-called impact that was just kind of how you

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feel after you smoke one or two puffs of smoke, so that there was literature about these physiological effects, and I think there was a stretch there, although I wasn't there in 1971, I have never seen actually any physiological studies.

Q. From Liggett?

A. From Liggett.

Q. Have you seen physiological studies from any other cigarette manufacturer?

A. Yes.

Q. In connection with what?

A. On nicotine, cigarettes.

Q. Are these things that you have seen through that chemists -- Tobacco Chemists' Conference?

A. Some of it, uh-huh.

Q. Have you seen it also in preparation for this deposition, is that another area where you've seen documents from other cigarette companies?

A. I can't -- you would have to be specific. I looked at a lot of documents, but I don't know if I actually saw that or not.

Q. Okay. Well, let's go back to

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Exhibit 1335.

According to the summary here, the reason that Liggett in 1971 was pursuing this project to assess the increase of pH, was that the eventual goal was to lower the total nicotine present in smoke while increasing the physiological effect of the nicotine that remained, so that there would be no physiological effect lost on nicotine reduction; is that correct?

MR. MARKS: Objection to form.

MR. DIESETH: Objection.

A. It's known that if you convert nicotine to the freebase form, that is the unproteinated form, that it's more volatile, so that's part of the answer, that there would be a theoretical reduction in nicotine and a hypothesized increased physiological effect, but it wasn't measured.

Q. To put it in very simplistic terms, if you raise the pH, you can get more bang for the buck?

MR. DIESETH: Objection.

MR. MARKS: Objection.

A. A lot of people think that, but I

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don't know if I can say, you know, authoritatively that that's the case.

BY MR. GORDON:

Q. And that was essentially the premise that Liggett was operating under back in 1971; correct?

MR. MARKS: Objection.

MR. DIESETH: Objection.

A. I don't know. I wasn't there, so I can't answer that exactly, but reading through this, you get the impression that they were aware of nicotine.

The actual objectives, I don't know, but we were, in fact, doing pH measurements, and calcium hydroxide does affect pH.

Q. I think you probably answered my next question.

When it refers to CAOH2, that's calcium hydroxide?

A. Uh-huh.

Q. And calcium hydroxide is an ingredient that does not naturally occur in tobacco; is that correct?

A. Calcium occurs in tobacco as various salt forms, and whether it's in there as

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calcium hydroxide, I don't know, but you'll find calcium in tobacco, because you have things like soil and sand, and so on. It's kind of a contaminant that is unavoidable, so that you measure -- you can measure calcium in tobacco naturally.

Q. But calcium hydroxide would be a salt form of calcium?

A. That's right.

Q. And adding it to tobacco would make the tobacco more basic?

A. That's correct.

Q. And you raise the pH?

A. Correct.

Q. And thus increase the amount of freebase nicotine relative to the amount of acidic nicotine, correct, or salt-form nicotine?

A. Yes, in theory, uh-huh.

Q. Okay. And if we go to page 2 of -- well, actually, the first page of Exhibit 1335, but it's marked page 2, the conclusion in 1971 that was that by adding calcium hydroxide to the L&M blend, that increased the tobacco pH and the unfiltered smoke pH, but when you added the filter, that had a buffering effect, so the --

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there was no actual change in the filtered smoke; is that correct?

MR. MARKS: Objection, mischaracterizes the statement.

MR. DIESETH: Objection.

A. I have to reread that.

(Pause)

That's what it says, uh-huh.

BY MR. GORDON:

Q. By the way, I want to clarify something so there's no misunderstanding.

A. Uh-huh.

Q. In the questions I have been asking you about pH and its effect on nicotine, pH doesn't change the amount of nicotine; correct?

A. That's correct. It depends on -- well, that's a hard question to answer, because that's assuming that you don't have any that's volatile and will leave -- within total space, correct, but it may be volatile and move into the atmosphere.

Q. Okay.

A. It does increase the volatility of nicotine, so if you have it in confined space where it couldn't escape, that would be -- I

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believe that's correct.
Q. So, for example, if we were to take a closed system, a glass tube or something, the amount of nicotine present in a given amount of tobacco is not going to change as you adjust the pH?
A. That's correct, if you have an enclosed space and you account -- you don't let it escape. I would think that's the case.
Q. Okay. All that's going to happen as you adjust the pH is that the form of the nicotine is going to change?
A. Correct.
Q. Okay. Going back to Exhibit 1335, I apologize, but did -- what was your understanding of this issue of the effect of the filter on a cigarette that had calcium hydroxide added to it?
MR. MARKS: Objection to the form.
A. The calcium hydroxide, at least when I have been involved, was always added to the stems. I don't think it was actually added to the filter, unless -- is that what it says here?
BY MR. GORDON:
Q. Maybe I misspoke and I apologize.

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Exhibit 1335 on the page that's marked 2 talks about the effect that the L&M filter had on the smoke; correct?

A. Correct.

Q. And that the filter buffered the pH effect; is that right?

A. That's what it says here, uh-huh.

Q. And just so our understanding is correct, in 1971, this report indicated that if you had added calcium hydroxide to tobacco, it would increase the pH of an unfiltered cigarettes, but the filter effect was to buffer the increase had pH back to what it would have been before you added the calcium hydroxide?

MR. MARKS: Objection to the form.

A. That's what's implied from this memo.

MR. GORDON: Okay. Have this next one marked, please.

(Plaintiffs' Exhibit 1336 was marked for identification.)

BY MR. GORDON:

Q. Showing you what's been marked as Exhibit 1336, a document produced in discovery by Liggett bearing Bates number LG 0262127 through

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2129, a document entitled "Development of a Cigarette with Increased Smoke pH," dated January 22, 1973.

Have you had a chance to review that, 1336?

A. Right, I have now.

Q. And this is an internal Liggett research document; is that correct?

A. That's correct.

Q. And this is a follow-up report --

A. Uh-huh.

Q. -- on the same study we were looking at before in Exhibit 1335; is that correct?

MR. MARKS: Objection.

A. Looks like it's related.

BY MR. GORDON:

Q. Little over a year later; is that correct?

A. Yes.

Q. And under "Summary of progress," it says, quote, "The purpose of the research under this project was to develop a method for increasing the smoke pH of a cigarette," is that correct?

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A. Uh-huh -- yes, that's what it says, uh-huh.
Q. Okay. And it further states that "A low-smoke solids low-nicotine cigarette with an increased smoke pH would then have relatively more free nicotine in its smoke"?
A. That's what it says.
Q. And it goes on to say, "Consequently, a higher nicotine impact would result, producing a more satisfying smoke"?
A. That's what it says.
Q. Okay. And the results of the research as reported in this document, Exhibit 1336, were that smoke pH could be increased by using a perforated filter or by making the tobacco and/or the filter more basic; is that correct?
A. That's what it says, uh-huh.
Q. What is meant by a "perforated filter"?
MR. DIESETH: Objection.
A. A perforated filter, there are holes in a filter, and for dilution effects, so it's my understanding that that's what this would mean here.
MR. GORDON: Could I get counsel's

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explanation as to what the basis of that objection was?

MR. DIESETH: You're assuming this witness knows what the author of the document meant by this.

MR. GORDON: This witness is a 30.02(f) spokesman for Liggett.

Is that a foundation objection?

MR. DIESETH: Yes, it's a foundation objection.

MR. GORDON: Okay.

BY MR. GORDON:

Q. And when the phrase -- strike that.

Directing your attention to the phrase, "making the tobacco and/or the filter more basic," that's what we were talking about earlier --

A. Uh-huh.

Q. -- when you add something to it --

A. Uh-huh.

Q. -- that that makes it a higher pH, pushes the pH up the scale?

A. Correct.

Q. Now, if I can direct your attention

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to page 3 of Exhibit 1336, this Liggett research study concludes, quote, "All the increased smoke pH cigarettes generally exhibited an increased physiological impact"; is that correct?

A. Where are you reading from?

Q. The first line of the first full paragraph on page 3.

A. First line of where now?

Q. The first full paragraph -- right there, yes.

A. Uh-huh, that's what it says.

Q. Okay. So, apparently, there have been some assessment of the physiological impact of increased pH?

MR. DIESETH: Objection.

MR. MARKS: Objection.

A. I wasn't at Liggett at this time, but I can say that looking at our documents and talking to people, we didn't ever do physiology. However, there is a loose understanding, I think, that this feel, mouth feel, and so on, and the feel after taking a few puffs is equated to physiology perhaps in those days, and that's what I think this is referring to.

Q. You don't know what the basis of

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the statement that "All the increased smoke pH cigarettes generally exhibited an increased physiological" --

THE COURT REPORTER: I'm sorry, "of the" -- could you please repeat that?

BY MR. GORDON:

Q. "All the increased smoke pH cigarettes generally exhibited an increased physiological impact," you don't know what that specifically refers to in this document?

A. I wasn't at Liggett in those days, but I think it was not based on actual physiological measurements.

MR. GORDON: Okay. Why don't we take a quick break.

A. Uh-huh.

(Recess taken.)

THE COURT REPORTER: We are back on the record.

BY MR. GORDON:

Q. Dr. Dietz, I'm showing you what's been marked as Exhibit 1337, a document produced in discovery by Liggett bearing Bates number LG 0262509 through 2512, a memorandum entitled "Modification of Smoke pH," dated 7-16-76.

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(Plaintiffs' Exhibit 1337 was marked for identification.)

A. I see it. I'm reading through it right now.

BY MR. GORDON:

Q. Why don't I give you an opportunity to finish reading through it.

A. Okay. Okay.

Q. This is an internal Liggett research report; is that correct?

A. It is.

Q. Who are the two individuals listed at the top?

A. Okay. It's directed, it looks like, to Robert Kersey, Bob Kersey, who is the director, I believe, at the time from V. Norman, who was one of the senior scientists.

Q. Kersey was director of research; is that right?

A. At one time. I don't know if he was director at this particular time.

Q. Okay. And Norman was a senior scientist in the research department?

A. Correct.

Q. Okay. And this is apparently

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further discussion of the pH issue that we looked at in some earlier documents, as well; is that correct?

A. That's correct.

Q. Okay. And the first line of Exhibit 1337 indicates that "The pH of smoke of typical blended filter cigarettes on the U.S. market is in the neighborhood of 6.0"; is that correct?

A. That's what it says, uh-huh.

Q. Okay. And it goes on to say, "At this pH, practically all the nicotine in smoke is in salt form"; is that correct?

A. That's correct.

Q. Is that consistent with your understanding?

A. Correct.

Q. Okay. And again, so we're clear on the terminology, that would mean that at a pH of 6.0, almost all of the nicotine is in the nonfreebase form; correct?

MR. MARKS: Objection to the form.

A. At six, it's in the -- primarily in the nonfreebase form, according to theory.

BY MR. GORDON:

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Q. Okay. And then I want to direct your attention to the bottom of this first paragraph where it says, "Small adjustments of smoke pH result in large shifts in the proportion of free nicotine."
Do you see that -- very last line of the first paragraph?
A. The first paragraph, okay.
Right, uh-huh, I see that.
Q. Okay. And it refers to a figure, figure one?
A. Right, which is attached.
Q. And that's the very back page?
A. That's correct.
Q. Okay. Now, the jury will be able to see this -- this figure, but so we understand, the pH is on the bottom line; is that right?
A. That's correct, uh-huh.
Q. And along the left-hand side of this graph is the percent of free nicotine; is that right?
A. That's correct, uh-huh.
Q. And if I -- let's see if we're understanding, or rather, if I'm understanding this graph correctly.

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At a pH of five, there's essentially 0 percent free nicotine; is that right?

A. According to this graph.

Q. Okay. And if we get up to a pH of about eleven or so, essentially a hundred percent of nicotine is freebase?

A. That's what's indicated on the graph, uh-huh.

Q. And if we move from a pH of five to a pH of about six, there's very little increase in the amount of freebase nicotine; right?

A. That's correct.

Q. It goes up to maybe 1 or 2 percent, according to this graph, right?

A. Right, it's very small.

Q. But if you move from six to seven, it jumps from about 2 percent of freebase at a pH of six to about 10 percent freebase at seven; is that right?

MR. MARKS: Objection to the form.

A. It's moving towards 10 percent.

BY MR. GORDON:

Q. Okay. And the increase from six to seven is much more pronounced than the rate from five to six?

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A. The rate is increasing at that point in time, uh-huh.
Q. And from seven to eight, it's an even steeper increase; is that right?
A. Right, uh-huh.
Q. And by the time we get up to a pH of eight, we are already up to close to 50 percent freebase nicotine; is that right?
A. You're right about 50 percent at eight, uh-huh.
Q. Okay. And as we move from pH eight to nine, it jumps to almost 90 percent or over 90 percent?
A. Right, uh-huh.
Q. So, the -- this graph shows that the big movement in the amount of freebase nicotine really takes place between about a pH of six and a pH of nine; is that right?
A. Six to eight or nine is where you get your dramatic change.
Q. Okay. And if -- if you assume that most blended U.S. cigarettes are at a pH of 6.0, the reference on the first page of Exhibit 1337 to "Small adjustments of smoke pH result in large shifts in the proportion of free nicotine," that's

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talking about that shift from six -- a pH of six to seven or seven or eight?

MR. MARKS: Objection.

A. That's correct.

BY MR. GORDON:

Q. And if I could direct your attention back to the first page of Exhibit 1337, still in that first paragraph, it says, "The rapidity with which the nicotine transfers into the smoker's bloodstream is strongly influenced by whether it is in the salt form or a freebase, the latter being absorbed approximately five times as fast."

Do you see that?

A. I see that, uh-huh.

Q. And what that refers to is not the amount of nicotine that's getting into the bloodstream, but how quickly a given quantity of nicotine gets into the bloodstream; is that correct?

MR. DIESETH: Objection.

A. That's what -- that's what this is saying, uh-huh.

BY MR. GORDON:

Q. So, in other words, if you had a

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given quantity of nicotine, X amount of nicotine, if all of the nicotine existed in the salt form, it would get into the bloodstream about one-fifth as quickly as if that same X amount of nicotine was all in the freebase form; is that right?

MR. MARKS: Objection to the form.

MR. DIESETH: Objection.

A. That's what this is saying on theory, but I don't know if that's in practical terms whether that's what happens.

BY MR. GORDON:

Q. Okay. Do you know if Liggett has ever done any studies to disprove this?

A. No, Liggett never did a blood nicotine that I know of. This was based on a theory.

Q. Okay. What -- was it Dr. Norman or Mr. Norman?

A. Doctor, I believe Doctor.

Q. So, Dr. Norman's statement here was based on a physiologic theory; is that correct?

A. Well, I really don't know where he got his data from, but I have never seen anyplace where we have done blood nicotines.

Now, these kinds of data were

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published in the open literature. Whether he got it from that or not, but this is -- there was definitely theory along this line, uh-huh.

Q. Okay. And in a second paragraph, Dr. Norman talks about "choosing an optimum smoke pH"; is that correct?

A. Where are we now?

Q. Second paragraph.

A. Second paragraph, right.

Q. And he notes that it's a complicated issue because, as you raise the pH, it affects not only the nicotine, but other components, as well?

A. Correct, uh-huh.

Q. Okay. And as you raise the components of -- strike that.

He notes that as you raise the pH and affect some of these other components, it affects the taste of the cigarette?

A. That's correct.

Q. And in the third paragraph, he goes on to say that because of these taste effects, one is not completely at liberty to choose a pH that is optimum for nicotine?

A. That's my reading of it.

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Q. Okay. So, he suggests a compromise as to how much free nicotine is adequate and how much the basic taste complex can be tolerated?
A. Uh-huh.
Q. As you raise the pH?
A. That's correct.
Q. Okay. And he goes on to say that "In practice, Liggett has operated in the pH range from six to seven, which is still less than 10 percent of the nicotine in freebase form, but not yet overwhelmingly robust"; right?
A. That's what he is saying here, uh-huh.
Q. Okay. And he notes that smoke pH can be adjusted by changing the tobacco blend by -- in other words, by the type of tobacco that's in the rod?
A. Uh-huh; uh-huh.
Q. Is that right?
A. Whether it be burley, cured or what the constituents are in there presumably will affect the pH.
Q. Higher burley content affects the pH; is that right?
A. I believe that's correct.

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Q. Okay. And another way he notes of adjusting the pH is through additives to the blend; is that right?
A. That's correct.
Q. And another way is additives to the filter; right?
A. That's what they were looking at at the time, uh-huh.
Q. And he notes that some compounds have been studied, including calcium hydroxide; is that right?
A. It looks like they were looking at a calcium hydroxide.
Q. And apparently also magnesium hydride?
A. A variety of bases -- salt bases they were looking at, correct.
Q. And he describes one as "the current best candidate."
Do you see that?
A. The third paragraph?
Q. Fourth paragraph.
A. Right, potassium phosphate, uh-huh.
Q. Okay. And he notes that with potassium phosphate, that that was particularly

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promising in low-yield cigarettes where the increased physiological impact of nicotine, as well as an increased flavor impact are needed.

Do you see that?

A. I see that.

Q. What is meant by a low-yield cigarette?

A. Low tar and nicotine delivery, according to the FTC method.

Q. So, for the low tar and nicotine cigarettes, an increased flavor impact and increased physiologic impact of nicotine were deemed to be necessary, according to this; right?

MR. DIESETH: Objection.

A. Right. Well, you're decreasing your tar and nicotine, so he's saying that tar has flavor, nicotine is considered desirable, and you're decreasing both of those, so you have to somehow in his view compensate for that, uh-huh.

BY MR. GORDON:

Q. At one point, Liggett studied the possibility of adding nicotine to cigarettes; is that correct?

A. It's my understanding that Liggett did a little study where they added nicotine

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malate, and it was more of a smoke panel type of study where there were -- in those days, people were of the opinion that nicotine had some taste aspects to it, and I think that's still debatable today, and so they did do some limited amount of studies along that line, but I don't think it was ever brought into production.

Q. In the commercial cigarettes sold by Liggett, nicotine was never added?

A. To my knowledge, no.

Q. Are you aware as to whether some of the things we have talked about this morning, the pH effects, the rapidity of transfer to the bloodstream, whether those sorts of things were issues that Liggett alone had studied and knew about or were things that other tobacco companies knew about, as well?

A. There were -- there was literature along this line, so the dates, I guess, are what's confounding me a little bit, because we are back in the '70s, and I'm not quite sure how the chronology goes, but there's definitely literature about these kinds of effects, and I think it was somewhat just general knowledge that pH will affect nicotine, whether it be freebase, salt, so

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on, and the theory being that the freebase is the one that's absorbed, but there are complications to that based on, you know, the member -- the physiologic membranes themselves are in seven, so you get a lot of buffering in there, and so the actual effect is sometimes the question, and like I said before, the heat itself will generate at least, according to some of the recent papers, a fair amount of this so-called freebase form, so the pH adjustment in theory, there's a lot of papers along that line, uh-huh.

Q. I'm going to show you what's been previously marked as Exhibit 322. It's a document produced by British-American Tobacco Company limited, two-page document bearing Bates stamp number 100059066 through 9067.

A. Uh-huh.

Q. A document entitled "Potassium Carbonate."

A. Uh-huh.

Q. What -- what was the potassium that we were referring to in the last document; was that potassium --

A. I think it was potassium phosphate, I think.

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Q. Phosphate.
A. I would have to check. I'm sure it was, yeah.
Q. Okay. And I think the date on Exhibit 322 appears on the second page at the bottom, 7-8-64?
A. Uh-huh.
Q. Okay.
A. I see it.
Q. What I want to direct your attention to is the very last paragraph on page 2 of Exhibit 32 -- 332, excuse me, and first of all, the first line of that paragraph, quote, "Nicotine is in the smoke in two forms, as free nicotine base -- think of ammonia -- and as a nicotine salt -- think of ammonium chloride -- and it is almost certain that the free nicotine base is absorbed faster into the bloodstream"?
A. I see that sentence.
Q. And that's consistent with what we were just going through with the internal Liggett document; is that correct?
A. That's what was stated in that document, uh-huh.
Q. Okay. And in this second -- in

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this last paragraph, it says, "Thus, the effect of this potassium carbonate treatment, even though it does reduce the total quantity of nicotine in the smoke, may be to enhance the effect of what is left until it is equal or greater in," says "psychological" in typed and crossed out and "physiological" written below, "effect than the original smoke."

Do you see that?

A. Right, uh-huh.

Q. And that's consistent with what we were looking at in the internal Liggett document; correct?

MR. MARKS: Objection to the form.

MR. DIESETH: Object.

A. It's a very similar kind of statement.

BY MR. GORDON:

Q. Okay. Let me show you what's been previously marked as Exhibit 1094, a document produced in discovery by R.J. Reynolds Tobacco Company bearing Bates number 504438506 through 8512, a document that on its second page is entitled "Draft 8-9-82, Ammonia."

A. Uh-huh.

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Q. Do you see that?
A. Uh-huh.
Q. Okay. And I want to, in particular, direct your attention to the page that is four pages in. There are no numbers on the pages themselves, but it has the Bates number ending in 8509.
A. Okay.
Q. Okay. And it -- the first point there made towards the bottom in a series of points, number one, "The pH of cigarette smoke is important to smoke quality and can be used as a measure of the physiological strength of smoke"?
A. Uh-huh.
Q. Do you see that?
A. Uh-huh.
Q. Again, that would be consistent with the Liggett document and, in fact, the BAT document we just read; is that correct?
MR. DIESETH: Objection.
MR. MARKS: Object.
A. The idea is -- is -- is very similar.
BY MR. GORDON:
Q. Okay. And it goes on to say in

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number two, "Ammonia in smoke is one of the major pH controlling components"?
A. Uh-huh.
Q. "Others include nicotine, amines, organic acids and carbon dioxide"?
A. I see it, uh-huh.
Q. Okay. Did Liggett ever add any ammonia or ammonia compounds to its cigarettes?
A. I can't speak for the total of history, but I know in my time, we did for about three years -- not ammonia, we added a -- I have to correct myself on that, diammonium phosphate.
Q. Diammonium phosphate is a compound that includes ammonia; is that correct?
A. That's correct, uh-huh.
Q. What were the three years?
A. I believe it was 19 -- it was somewhere in the area of 1993, and we just took it out in 1996.
Q. Why did Liggett begin adding diammonium phosphate?
A. Okay. I wasn't part of the decisions, although I was connected to memoranda, and so on, but the actual decisions were based on the fact that in the stem, it was put in -- our

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product development people put it in because it reduced the harshness of the stem, and this is based on the fact that aldehydes in acids presumably are muted, the harshness effect of these materials with ammonia-type compounds.

There's also flavor generation of pyrazine type compounds that occur with ammonia, so that was another explanation.

Those were the two primary reasons, having knowledge that ammonia is a controversial compound, but our people tell us that we felt that it didn't really -- the pH effect was minimal, if anything.

Q. Diammonium phosphate is capable of having a pH effect on tobacco --

A. Well, certainly, it's a compound. That's one of its characteristics, uh-huh.

Q. What do you mean by the phrase, "controversial compound"?

A. Well, there's been a lot of attention on diammonium phosphate.

Q. Attention in what areas?

A. Just the general press. I guess that's the best answer I can give you, just general -- fair amount of attention on it.

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Q. Do you have any understanding as to whether any other cigarette manufacturers have ever used diammonium phosphate?
A. I don't know specifically. I have been told so.
Q. Have you been told that every other cigarette manufacturer except Liggett has used diammonium phosphate?
A. I have seen that written.
Q. Have you ever discussed that with any tobacco scientists from any other cigarette companies, the issue of whether they used diammonium phosphate?
A. I know I haven't.
Q. You've seen the annual industry lists?
A. Yes.
Q. And diammonium phosphate was on it for years when Liggett was not using diammonium phosphate; correct?
A. That's my understanding. I don't keep a photographic memory of all those lists, but I'm sure it was on there before and after.
Q. And you've also seen other ammonia-based compounds on that master list?

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A. I have.
Q. Ammonium hydroxide?
A. I would have to go look, but I believe it might be one.
Q. Urea --
A. Yes.
Q. -- which is a source of ammonia; is that correct?
A. That's correct.
Q. Ammonium carbonate?
A. I'm not certain about that. I would have to check, but it may be.
Q. But, in any event, other than the three years that Liggett was adding diammonium phosphate to its stem, Liggett has never used any ammonia or ammonia-based compound in its cigarettes?
A. Well, with regard to diammonium phosphate, that was our big, so-called ammonia-type treatment.
We -- there may have been some kind of ammonia -- salt along the line, I can't say absolutely, but there was a fairly large component of our strategy at the time, and that was based mostly on, like I said, the stems being harsh and

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trying to -- to mute the harshness of those stems, and then there was also one other area we added diammonium phosphate. I really was reluctant to mention that, and that was on our reconstituted tobacco.

Q. When was that?

A. Well, it was in the same period of time, in the '93 to '96 period of time, and that was added to release pectin, so, diammonium phosphate has multiple function.

It's my understanding that it also has a burn function that is in terms of the burn rate of tobacco and paper, so pH modification is just one of those.

MR. MARKS: Can we take a two-minute break at this time?

MR. GORDON: Oh, sure.

(Recess taken.)

THE REPORTER: We are back on the record.

BY MR. GORDON:

Q. Dr. Dietz, why did Liggett stop using diammonium phosphate?

A. Two that I can bring to your attention, and I think those are the only two,

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with regard to the stems, we went to a puff stem type casing or -- well, it wasn't casing, but -- so we had a puff-stem situation where it was a little bit different kind of a stem, and the diammonium phosphate, it's my understanding, just didn't work out very well in that context in terms of machineability, and so on. They would clog up, and so on.

The other situation with regard to recon, we switched to another supplier based on economic considerations, and that supplier used hundred percent tobacco, is my understanding, and it was, as I understand it, a paper process.

Q. Okay. I would like to show you what's been previously marked as Exhibit 1058, a document produced in discovery by R.J. Reynolds Tobacco Company bearing Bates number 511223463 through 484, a document entitled "Implications and Activities Arising from Correlation of Smoke pH with Nicotine Impact, Other Smoke Qualities and Cigarette Sales"?

A. Uh-huh.

Q. Have you ever seen this document before?

A. It was provided to me in

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preparation by you.
Q. Did you have an opportunity to review it?
A. I did look over the document, yes.
Q. Okay. It's a lengthy document, and I certainly don't want to preclude you from looking at any part of it you need to look at in order to answer the few questions I have, but I particularly want to direct your attention to page -- what's numbered page 2 of the document, the section marked Roman numeral III, "Smoke pH and Free Nicotine."
A. Uh-huh, I see.
Q. First of all, that first sentence there, quote, "In essence, a cigarette is a system for delivery of nicotine to the smoker, in attractive, useful form"?
Do you see that.
A. I'm trying to follow. Is that the first paragraph there?
Q. Very first sentence, very first paragraph.
A. Okay. I see it, uh-huh.
Q. Does Liggett agree with that position?

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A. That's one component of smoking. I don't -- I don't think it's the total picture.
Q. Liggett would agree, then, that there's -- at least one aspect of smoking is to deliver nicotine to the smoker; correct?
A. I would say so, because all the denicotine products have not been that successful.
Q. Okay. This paragraph goes on to say, "At normal smoke pH at or below about 6.0, essentially all the smoked nicotine is combined with acidic substances, hence, is nonvolatile and relatively slowly absorbed by the smoker."
Do you see that?
A. Uh-huh.
Q. And that again would be consistent with the last ligament document we had looked at, Exhibit 1337; correct?
A. This is consistent with the documents. However, I don't know if I would agree to that.
Q. Which part are you not sure you'd agree with?
A. Well, I think, you know, this is again all based on theory, and there's current information available that, you know, just heat

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itself will convert nicotine to the freebase form, and during the smoking process, and also the physiological buffering, you know, where -- where nicotine would actually get into the lungs.

So, those things, I think, it's sort of a stretch to say that, you know, you can actually say that there's absorption there. In theory, this is all true, and I think at the time and probably even today, people feel like there's some validity to this, but it's not totally without question.

Q. Well, you've raised a couple issues and you raised them before, so I guess I want to address them.

You talk about the current information on heat.

A. Uh-huh.

Q. You're talking about a single paper authored by Philip Morris scientists; is that correct?

A. That's correct.

Q. And that was a paper that was offered by Philip Morris in response to charges that Philip Morris was intentionally manipulating the form of the nicotine in its cigarettes;

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correct?
MR. DIESETH: Objection.
A. I can say that it was authored by Philip Morris.
BY MR. GORDON:
Q. And the paper essentially said that if you get up to a high enough temperature, it will volatilize all the nicotine to freebase; correct?
A. That's correct, uh-huh.
Q. But the temperature that it talked about was a temperature that is not reached in all parts of the rod of a tobacco -- excuse me -- of a cigarette when it's actually being smoked, correct?
MR. DIESETH: Objection.
A. There's a temperature gradient, so that's correct.
BY MR. GORDON:
Q. So, at one point in the rod, the temperature might be high enough to volatilize all the nicotine at that point in the rod?
A. Right.
Q. But at other points in the rod, the temperature is going to be lower; correct?

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A. But as I recall that paper, the temperatures were relatively low, like somewhere in the area of 130, 160 degrees, and the maximum gets up to about six to 800, so it's fairly low on the continuum, but there is probably some point there where it would be below that.
Q. What's the temperature of smoke when it enters a smoker's mouth?
A. I don't know.
Q. Is it 800 degrees?
A. No.
Q. Quite a bit less, isn't it?
A. Right.
Q. And the other issue you raise is the lung buffering?
A. Uh-huh.
Q. And the theory there is that because the lung has a pH of seven or so, that even if the nicotine is introduced in a salt form, that the buffering capacity of the lung will change -- convert it from a solid form to a freebase form and then it will transport it across the lung barrier; is that right?
MR. MARKS: Objection to form.
A. Well, the lung has a pH of about

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7.3 to four, and so on, so the buffering would mean that if you -- if you were in a high pH situation, you know, you will bring everything kind of close -- close to that pH, which would be seven, which you're making a good point that you're going to get a fair amount of absorption no matter what, if you look at seven being, you know, what's in the lung, but certainly, it depends on where you are in the continuum.

Q. The continuum of freebase --

A. Right.

Q. -- versus salt?

A. Uh-huh.

Q. In what way does it matter?

A. Well, if you're moving from eight to seven, then you're going to go more towards the base -- towards the acid side.

Q. Okay. Assuming that the smoke that comes in is less than 7.4, the theory that you're talking about is that once it gets to the lung, the lung -- the lung capacity is going to bring it up to 7.4?

A. Right, it should equalize things, to some extent, and bring everything back to the same.

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Q. How long does it take for nicotine in the salt form in the particle phase of smoke to equalize to freebase nicotine in the vapor phase in smoke inside the lung?

A. I wouldn't know how to answer that question. You'd have to ask an expert.

Q. Okay. It takes some amount of time?

A. Probably, there's some time, yeah, uh-huh.

Q. So, if the smoke goes in already in a freebase form in the vapor phase, whatever amount of time that it is that it would have otherwise taken to go from salt form in the particulate phase to the free form in the gaseous phase, that time is eliminated; right?

MR. MARKS: Objection.

MR. DIESETH: Objection to form.

A. I don't know. I just don't know if you could say that. I'm a little bit confused about your proposition there. Maybe if you repeat it.

BY MR. GORDON:

Q. Okay. Well, you concede that if the nicotine goes in in the salt form in the particulate phase, there is some quantum of time,

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whatever that quantum of time is, for it to equilibrate to the freebase gaseous phase in the lung; right?

MR. DIESETH: Objection.

MR. MARKS: Objection.

A. I guess I'm confused about the proposition, because you have vapor, as well as particulate, and I'm not quite sure how that works out from a dynamic point of view once it gets into the lung. I'm just not an expert in that area.

BY MR. GORDON:

Q. Okay. You'd defer to an expert?

A. I would defer to somebody like Benowitz or one of the experts in kinetics.

Q. And "kinetics" refers to the physics of the transport itself --

A. Right, uh-huh.

Q. -- not the amount of nicotine?

A. Well, amount is taken into consideration, but it's mostly rate. We're looking at rate, as well as amount.

Q. Okay. So, there may be a difference in rate of absorption of freebase versus salt-form nicotine?

A. Right.

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Q. Okay. And at least in theory, you would expect that freebased nicotine would -- strike that.

At least in theory, you would agree that the kinetics of freebase nicotine would be faster transport than salt form; right?

MR. DIESETH: Objection.

A. If you override the buffering, and so on, right, but I can't really be authoritative about that, but there's a -- if you -- if you just look at the theory of salt versus freebase, that would probably be true.

BY MR. GORDON:

Q. What do you mean by "override the buffering"?

A. Well, I mean, in other words, you have -- you have physiological fluids and you have the pH of the physiological fluids, so you have dilution, possibly a buffering. The rates of all these things, I'm not totally able to answer that question based on all these considerations, but I think it would be a complex situation, and I recall that, you know, Dr. Kessler really couldn't answer that. It's really a pretty complicated issue.

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Q. Okay. Let's go back to Exhibit 1058.

Again, continuing along with the same first paragraph on page 2, quote, "As the smoke pH increases above about 6.0, an increasing proportion of the total smoked nicotine occurs in free form, which is volatile, rapidly absorbed by the smoker and believed to be instantly perceived as nicotine kick"?

A. Correct, uh-huh.

Q. And does Liggett agree with that position, as well?

A. Well, I think it's a very complicated issue. I think there is a -- I don't know if I could say Liggett agrees to that issue, because I don't know if we have experts that can make those kind of statements.

Q. Okay. And it refers to a chart eight, which appears on page 13; is that right?

A. Page 13 -- oh, okay.

Q. And that chart is essentially the same chart that appears on the last page of the Liggett document, Exhibit 1337?

A. Uh-huh, right, very similar.

Q. Is that correct?

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A. Uh-huh.
Q. Basically, the same data?
A. Right, looks like it's the same data.
Q. If I could direct your attention now back to the second paragraph on page 2, it says in the second sentence there, "Marlboro smoke is typically at pH 6.8 to 7.3, and Kool smoke is typically at 6.4 to 6.6, as compared with Winston smoke at pH 5.8 to 6.0, and Salem smoke at pH 6.0 to 6.2."
Do you see that?
A. I see it.
Q. Did Liggett ever do any studies of the pH of competitive brands?
A. I have not seen this kind of data where we looked at competitive brands.
Q. Is this the first time you've seen data indicating that Marlboro smoke is in a pH range of 6.8 to 7.3?
A. I think so, uh-huh.
Q. What's the pH of Liggett brands?
A. We're not currently measuring our pH, so I couldn't answer that question.
Q. When was the last time Liggett did

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measure?
A. It could be back before my time. We just haven't really looked at pH since I have been there, at least any kind of -- in any methodical way. There possibly could have been an extraneous measurement at one time, but it was -- I can't recall of any.
Q. Are you aware of Liggett ever selling cigarettes that had a pH in the 6.8 to 7.3 range?
A. I'm not aware of it.
Q. Are you aware of the impact -- strike that.
Are you aware of the effect that the addition of ammonia and ammonia compounds to reconstituted tobacco has on the nicotine transfer efficiency?
A. Only from what I've seen. I think one of the documents you provided had something to do with that.
Q. Do you recall what it said?
A. I don't recall, but I -- I think there was some mention of that in one of the documents.
Q. Liggett has done no studies on

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nicotine transfer efficiency?
A. To my knowledge, no.
Q. How about the issue of nicotine scavenging as between the reconstituted portion of a cigarette and the nonreconstituted portion?
A. Uh-huh.
Q. Does -- do you have any understanding as to the effect, if any, that ammonia has on that phenomenon?
A. I don't have any direct knowledge of that. I've seen in those documents where there seems to be before and after differences in nicotine, and whether that has to do with ammonia, I don't know.
Q. Okay. Was that something you had been aware of before seeing these documents?
A. Not before seeing these documents.
Q. Just so the record is clear, when you're talking about "these documents," you're talking about documents that you reviewed in preparation for this deposition that were produced by other cigarette manufacturers?
A. Correct, uh-huh.
Q. Would it be correct then that Liggett, to your knowledge, has no internal

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research about the nicotine scavenging phenomenon between recon and nonrecon?
A. I have never seen anything like this.
Q. Did it come as a surprise to you when you saw that?
A. A little bit. I had to go ask a fellow worker if I understood it right, and he said, "Yeah, that's the way I understood it."
Q. Earlier, you said that -- that Liggett had change suppliers for its reconstituted tobacco; is that correct?
A. That's correct.
Q. Initially, it was obtaining it from a company called Schwitzer; is that correct?
A. Schwitzer Mundot, which is also Kimberly Clark, as well as American Tobacco was our original source, then we went to Consolidated Cigar, and that's where we started using the diammonium phosphate for that brief period of two to three years there.
Q. The recon from Consolidated Cigar had diammonium phosphate?
A. That's correct.
Q. Do you know who owns Consolidated

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Cigar?

A. I would only have to guess. I'm not absolutely certain.

Q. What's your best understanding of who owns Consolidated Cigar?

MR. DIESETH: Objection.

A. I think it's Perlman, but I don't know.

BY MR. GORDON:

Q. Do you know if -- have you ever heard of any affiliation between Consolidated Cigar and Brown & Williamson Tobacco Company?

A. I think they were one of their clients, if you will.

Q. Okay.

A. That's what I heard.

Q. And Liggett is no longer purchasing recon from Consolidated Cigar?

A. No.

Q. Is it still purchasing it from Kimberly Clark?

A. No.

Q. How about American?

A. No.

Q. Is it doing any in-house

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reconstituted tobacco?
A. We're purchasing it from another company now.
Q. Since when?
A. I can't say exactly when, but I think it was last year sometime.
Q. Okay. But subsequent to 1994?
A. Yes, uh-huh.
Q. Okay. That's the date this lawsuit was commenced?
A. Right.
MR. GORDON: Okay. I'm going to have another document marked.
(Plaintiffs' Exhibit 1338 was marked for identification.)
BY MR. GORDON:
Q. Showing you what's been marked Exhibit 1338, a document produced by Liggett in discovery bearing LG 2010420 through 0424, a document entitled "History of Expanded Tobacco Casing Formulation."
A. Uh-huh.
Q. Do you see that?
A. Uh-huh.
Q. Basically, my simple question is:

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Is this an accurate history of the use of expanded and reconstituted tobacco by Liggett, and if so, up to what point is it accurate?

MR. DIESETH: Mr. Gordon, if I may, is this a category two document?

MR. GORDON: No.

A. Yes. It's -- I've seen this kind of a document before, these case history-type documents. It looks like it's for a specified period of time, probably used in preparation for a possible lawsuit.

BY MR. GORDON:

Q. Can you tell what time it's current to?

A. The last date I can see on there is probably eighty -- in the '80s, '84, I believe, and it starts in -- well, there's a question in a couple of places, but it looks like, in general, '54.

Q. Okay. This does not, for example, on the reconstituted tobacco page say anything about Consolidated Cigar; correct?

A. Correct.

Q. So, it wasn't -- it's not current -- strike that.

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It's not as recent as the Consolidated Cigar?
A. Right.
Q. That would have been about 1993; is that right?
A. Well, like I said, we stopped using that product actually last year, so '96, and we used it for about two years, so I'd say we used it maybe '95, '96, somewhere in that area.
Q. So, this is -- Exhibit 1338 is probably current somewhere between '84 and '94?
A. Right.
Q. Okay.
A. It's not up to date.
Q. Okay. The tobacco industry is obligated to disclose to the U.S. government the additives to its cigarettes; is that correct?
A. Uh-huh; uh-huh.
Q. You have to answer out loud.
A. Correct, that's correct.
Q. And the way the industry does that is to have each manufacturer provide a list to a single law firm, which then prepares a master list?
A. That's correct.
Q. That law firm is

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Covington & Burling in Washington?
A. Correct.
Q. And one of your responsibilities has been to submit the Liggett list to Covington & Burling?
A. That's correct.
MR. GORDON: Okay. Have this next document marked.
(Plaintiffs' Exhibit 1339 was marked for identification.)
BY MR. GORDON:
Q. Showing you what's been marked as Exhibit 1339, a single-page document produced in discovery by Liggett bearing Bates number LG 2018502, memorandum dated May 15, 1992, from you to Steve Miller.
A. Uh-huh.
Q. And the subject is "Review of Ingredients for New Chesterfield all Lamina"; is that correct?
A. That's correct, uh-huh.
Q. And there's just one line I want to direct your attention to or two lines, I guess, towards the bottom of this memorandum.
Quote, "From time to time, there is

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concern and discussions regarding individual ingredients on the C&B list for their potential biological effects. Certain ingredients have been removed as a result of these discussions."

A. Uh-huh.

Q. What does that refer to?

A. Well, Covington & Burling maintains a list of ingredients, as you know, and they have consultants that oversee this list who are fairly well-known toxicologists, and there have been occasions when something was brought to our attention about some mutagenicity or the potential for one of the ingredients to be -- to have a biological effect, and so discussions sometimes would arise as -- just to keep us informed of those effects.

Q. What ingredients have been removed as a result of those discussions?

A. You know, it's -- it's difficult for me to answer that question. It should be a straightforward question, but that list, the way the procedure would go is, there's discussion of an ingredient, and all the companies, it's up to them as to whether they would remove it or not, and the only way I would know is to know what

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each, individual company did, and I just don't know the answer to that.

Q. You used the term "mutagenicity."

A. Uh-huh.

Q. What does that refer to?

A. "Mutagenicity" is determined in a variety of ways, but it usually implies that there is some kind of effect on DNA, whether in the case of the Ames study, you have an Ames test, which is basically a bacterial test.

There are tests that can be based on white blood cells, sister chromatid exchanges, which could be from human or any animal, and basically, you have an effect on DNA, or there is the so-called clastogen-type effect, where you'll have breakup of chromosomes, so it's a variety of tests anywhere from bacteria to higher animals, and it's usually noninvasive in the sense that you would take blood samples or use bacteria, so it's an indication that there may be a problem, but you also have DNA repair, so it's not -- it's not ultimate, but it is kind of -- from the point of view of testing, a screen for potential problems.

Q. As a basic proposition, if something is mutagenic, that means it's capable of

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producing some sort of harm to biological membranes or organisms; right?

A. It is potentially capable, but there could be repair.

Q. So, as a general proposition, when you're making substances for consumption by human beings, you try to avoid using substances that are mutagenic; correct?

MR. MARKS: Objection.

A. Correct, but it's not an be-all/end-all, because as I mentioned before, some of these testings are bacterial, and it depends on how closely you mimic the human situation, and you have to realize also that there's repair and the carcinogenic process is not totally NDA driven, there's also proliferation. There's multiple activities or events that go on, hormonal effects, but it is one component of the process, and it raises your attention to that particular compound.

Q. Have you ever been told that certain ingredients were used in cigarettes that were not declared to the federal government?

A. No.

MR. GORDON: Let me have another

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exhibit marked here.
(Plaintiffs' Exhibit 1340 was marked for identification.)
THE COURT REPORTER: Thirteen forty.
BY MR. GORDON:
Q. Let me show you what's been marked as Exhibit 1340, single-page document produced in discovery by Liggett bearing Bates number LG 2018558, a memorandum dated September 22, 1993, from you to Joe Murray, Jim Totty and Greg Sulin; is that correct?
A. That's correct.
Q. Okay. And first of all, who are those three people?
A. Joe Murray at the time was our legal counsel. Jim Totty was at the time VP of operations, and Greg Sulin was director of research at the time.
Q. Okay. I want to direct your attention to the first full paragraph and the line that I think is second to the end there, quote, "It should also be noted that not all the listed ingredients are on the current six-company C&B list, and some have never been declared, according

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to James Fox of C&B. These ingredients were most likely taken from other cigarette company lists submitted to HHS, in addition to the six-company C&B list."

Do you see that?

A. Right, uh-huh.

Q. What does that refer to?

A. Well, there was a time that we were -- it was brought to our attention, I believe it was because of a study that CDC had done, and they were the ones who received our ingredients list, that certain ingredients were open to question, and it was based on this EFAUS list, which is everything added to food in the United States, and then they were looking at things like OSHA lists, and so on, a variety of lists, and so they had categorized and flagged, I don't -- a number of ingredients, and some of those ingredients, according to Covington, were never used by our six-company group, but it was brought to our attention, also, that, well, other companies provide lists, too, so that must be the way it came in.

Q. Other companies other than the other six?

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A. Right, uh-huh.
Q. Excuse me, or other than the other six?
A. Right, uh-huh.
Q. All right. Thank you.
MR. GORDON: Have this marked, please.
(Plaintiffs' Exhibit 1341 was marked for identification.)
BY MR. GORDON:
Q. Showing you what's been marked as Exhibit 1341, a document produced in discovery by Liggett bearing Bates number LG 0299076 through 9092, memorandum dated July 26th, 1993, from you to Greg Sulin; is that correct?
A. Uh-huh, that's correct.
Q. And Greg Sulin at that time was director of research; is that correct?
A. I believe he was. He did move up to VP, but at this time, I think he was director of research.
Q. Okay. And this is your summary of a meeting that you attended in Germany; is that correct?
A. That's correct, uh-huh.

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Q. And this was a meeting attended by other cigarette manufacturers, as well?
A. That's correct.
Q. And primarily, scientists from other cigarette companies?
A. Mostly scientists, yes.
Q. And some lawyers?
A. A few lawyers, uh-huh.
Q. And, in fact, you indicate that Philip Morris, British-American Tobacco and R.J. Reynolds were the most actively committed cigarette manufacturers?
A. Based on their international activity, uh-huh.
Q. Okay. And you state in this memo, quote, "The importance of a unified or harmonized cigarette position in the face of a worldwide anti-tobacco movement is recognized by all and provides a basis for the goals and objectives of the committee"; right?
A. That's correct, uh-huh.
Q. Is it this organization, by the way, where you first were made aware of this Philip Morris paper on the heat effects of -- the heat effects on freebase nicotine?

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A. No. Actually, the heat effects is something I just heard about about a month ago.
Q. Where did you hear about that?
A. At the Tobacco Council Research Council in Winston Salem. It was news to me.
Q. The Tobacco Research Conference is one represented by representatives of other tobacco companies, as well?
A. Correct. That was not a discussion during this meeting.
Q. What's the difference between this ingredients committee reflected in Exhibit 1341 and the Tobacco Chemists Research Group?
A. Well, the Tobacco Chemists Research Group is kind of a group that discusses basic research that goes on in a variety of areas, anything from flavor to the cigarette technology, filter, paper, and so on, and nicotine has been mentioned, but in regard to the ingredients group, this is really an outcome of the Covington & Burling ingredients committee, whereby we're talking about things like labeling, submission of ingredients, whether they be brand-specific or generic, composited, and so on, and the attention here is more regulatory.

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The attention at the Tobacco Chemists Research Conference is purely scientific.

Q. And the basis of this international ingredients committee is to assure a unified industry position in the face of a worldwide anti-tobacco movement; right?

MR. MARKS: Objection.

A. I think that was a prevailing thought, that there was -- at the time, a need to heighten the attention, that there were across the world a variety of issues that were emerging, and that all these could impact on any one country, like brand-specific information was required in some countries -- hadn't been here yet, but it was -- the purpose was to sort of bring all this together and make us aware of the world-wide tobacco situation, and I think there was a broad interpretation that this was an antimovement.

BY MR. GORDON:

Q. In fact, in your memo in Exhibit 1331, you say that at this conference, Drs. Richard Carchman of Philip Morris and Cooper Rees of RJR described a global, electronic network of anti-tobacco activists," right?

A. Correct.

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Q. And some of the concern that you had and you've described that as particularly troubling, were movements to implement brand disclosures in Thailand --

THE COURT REPORTER: I'm sorry, could you repeat that question, please?

MR. GORDON: Sure.

BY MR. GORDON:

Q. And some of the areas that you indicated were discussed as being particularly troubling were movements to implement brand disclosures in Thailand, maximum permissible levels in the United Kingdom and Sweden, and premarket testing in Sweden; right?

A. Correct. These were mentioned during the meeting.

Q. By the way, the meeting itself took place on June 29th and 30th, 1993; correct?

A. Correct.

Q. Okay. I want to direct your attention to the very bottom of page 2, and particularly the sentence that says, quote, "The American list is limited to additives applied to tobacco during manufacture, while the German list includes all additives, including those added

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prior to cigarette manufacture, to include paper, filter, tobacco, adhesives, processing aids and pesticides."

Do you see that?

A. Uh-huh, I see it.

Q. What does that refer to?

A. The Covington & Burling list that you're referring to that -- where I was routinely involved only covered tobacco additives that the manufacturers applied.

The German list, as I understand it, considers paper, filter, other aspects of the cigarette besides just the tobacco, including tobacco, and I think there may be a little bit more on pesticide residues in the German regulations.

Q. So, if a U.S. cigarette manufacturer adds something to its paper, that additive is not disclosed in this list provided to the federal government; correct?

A. Correct.

Q. And if a U.S. cigarette manufacturer adds a chemical to its filter, that also is not disclosed to the federal government; correct?

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A. Correct. It's my understanding some -- with regard to that that some of the discussions that I attended with Covington & Burling was that at least with regard to the filter, that it was kind of understood that you don't add flavorants to the filter or to the paper.

Other additives are applied, like burn chemicals and plasticizers in the tow, but with regard to actual flavorants, that those are strictly in the tobacco.

However, there are ingredients added to paper filter that don't have a flavor function that are added, and those were -- those are not disclosed, but it was kind of like a gentleman's agreement that you just don't add additives with regard to flavor to those other two parts of the cigarette.

Now, I don't know whether that's ever adhered to, but it's just -- but it's not comprehensive.

Q. Is pH modification considered a process of flavoring?

MR. DIESETH: Objection.

MR. MARKS: Objection.

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A. That's a hard question, because there are the so-called Maillard-type reactions that involve ammonia and aldehydes, as well as amino acids, so whether you get a pH modification in there, I'm not quite sure, but it could be.
BY MR. GORDON:
Q. Well, let me ask the question a little bit differently.
If a U.S. manufacturer decided to add the chemical to the filter for the purpose of modifying the pH of the smoke, would that be considered a flavorant in violation of this gentleman's agreement?
MR. DIESETH: Objection.
A. I can't say for sure, but I would not understand it to be the case. I would think that that would be not a flavorant.
BY MR. GORDON:
Q. So, if a manufacturer was adding a chemical to the filter for the purpose of modifying the pH of the smoke, as you understand it, that would not be something they would have to disclose to the federal government?
MR. DIESETH: Objection.
MR. MARKS: Objection.

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BY MR. GORDON:
Q. Correct?
A. That's correct.
Q. So, if a manufacturer were doing that, adding something to the filter to modify the pH, the manufacturer would be inaccurate if it were to say it was disclosing to the federal government everything it was adding to cigarettes; right?
MR. DIESETH: Objection.
MR. MARKS: Objection.
A. Correct.
MR. GORDON: Let's take a quick break and let them change the tape.
(Recess taken.)
THE REPORTER: We are back on the record.
BY MR. GORDON:
Q. Dr. Dietz, I just have a couple more questions about this.
A. While it's on my mind, could I make just one point of clarification?
Q. Oh, sure.
A. Just for the record, the six-company committee has provided voluntarily

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some nontobacco ingredients to the CDC, but it's been on a voluntary basis, it's not been as required by statute, and I don't know where that is or how thoroughly it's been examined, and so on, that --

Q. Could that, by the way, be the source of some of these ingredients that we were talking about before?

A. No; no.

Q. All right. Going back to this international ingredients committee meeting, on page 3, you make reference to "A confidentiality agreement to bind all the attendees will be drafted by mid-August."

Do you see that?

A. Uh-huh, yes, I do.

Q. Was that ever done?

A. Not while I have been involved. We were excluded later on, so I don't know currently.

Q. What do you mean, you were excluded?

A. When Liggett became kind of an outsider -- I'm trying to think exactly when. It's probably been about a year or two ago, we were discouraged from attending some of these meetings.

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Q. What's your understanding as to why?
A. Because of some of the announcements that were made.
Q. Some of the positions that Liggett was taking?
A. Our positions on issues.
Q. For example, Liggett now takes the position that nicotine is addictive?
A. That's one of the positions, uh-huh.
Q. And that cigarette smoking does cause disease?
A. Right, uh-huh.
Q. And those are positions that the rest of the industry does not -- does not agree with publicly; correct?
MR. DIESETH: Objection.
A. That seems to be the case now.
BY MR. GORDON:
Q. And your understanding of it was that after Liggett took these positions about addictiveness and the health effects of cigarettes, that the other cigarette manufacturers excluded you from these types of meetings; is that correct?
MR. DIESETH: Objection.

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A. That has happened. Officially, we are no longer participating. The last time we participated was this -- March of this year, but there were exclusions that were occurring before that time, perhaps a year before then.

BY MR. GORDON:

Q. Okay. Let me go back to this international ingredients committee meeting in June of 1992. I just want to clarify the list of attendees or participants.

A. Uh-huh.

Q. I think it's unnumbered, but it's about five pages in.

A. Uh-huh.

Q. It would be page 7, I guess.

A. Uh-huh.

Q. Dr. Scott Appleton of Brown & Williamson was there?

A. Right, he was.

Q. And Charles Blixt of R.J. Reynolds was there?

A. That's correct.

Q. Dr. Richard Carchman of Philip Morris was there?

A. That's correct.

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Q. Dr. James Charles of Philip Morris was there?
A. Correct.
Q. Frank Daylor of Philip Morris was there?
A. Yes.
Q. Dr. Daniel Heck of Lorillard was there?
A. That's correct.
Q. Terry Mitchell of B.A.T. Southampton was there, right?
A. That's correct.
Q. Graham Read of B.A.T., Southampton was there?
A. Correct.
Q. Dr. D. Cooper Rees of R.J. Reynolds was there?
A. Correct.
Q. John Rupp from Covington & Burling was there?
A. That's right.
Q. Is he a lawyer?
A. He is a lawyer.
Q. Alex Spears from Lorillard was there?

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A. Correct.
Q. Dr. Robert Suber from R.J. Reynolds was there?
A. Correct.
Q. And there was a Dr. Lutz Mueller from RJRTI, Cologne?
A. That's correct.
Q. What's your understanding of what RJRTI is?
A. Dr. Mueller, it is my understanding that he oversees international operations with R.J. Reynolds, but I don't know his specific duties, but he works in conjunction with Dr. Suber.

(Plaintiffs' Exhibit 1342 was marked for identification.)

THE COURT REPORTER: Thirteen forty-two.

BY MR. GORDON:

Q. Dr. Dietz, I'm showing you what's been marked as Exhibit 1342, a document produced in discovery by Liggett bearing Bates number LG 2013303 through 3440, a document entitled "Master List of Cigarette Additives and Production Changes," and at the top, it says, "Draft

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5-15-87"?
A. I see it, uh-huh.
MR. DIESETH: Before you get -- to confirm, this is not a category two document?
MR. GORDON: That's correct.
A. Uh-huh.
BY MR. GORDON:
Q. And up in the upper left-hand corner, it says, "Webster & Sheffield"?
A. Right, I see it.
Q. Who was that?
A. That was a legal firm that was doing Liggett's product litigation some time ago.
Q. Webster & Sheffield is not currently representing Liggett; is that correct?
A. Jim Kearney and Frank Decker were our principal legal counsel at the time in this area.
They -- Webster, Sheffield, I believe, dissolved and they went to Mudge, Rose, it dissolved, and then they are now with Latham, Watkins, and we are currently working with Kasowitz.
Q. Latham, Watkins does not represent you, does not represent Liggett?

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A. I don't think so.
Q. And Kearney and Decker no longer represent Liggett?
A. No.
Q. And this was a document prepared -- strike that.
Was this a document prepared by Webster & Sheffield?
A. Well, they were very active in keeping histories, and we have -- I honestly don't know whether they prepared it or whether we provided it to them. I probably should have looked into that, but it could have been either. I know that they kept tabs on these sorts of things, as well as we did.
Q. Okay. And as far as you know, is this document accurate as to the cigarette additives and production changes of Liggett cigarettes up to 1987?
MR. MARKS: Objection.
A. I haven't gone through it every single sentence, but I would assume that that's the case, yes.
BY MR. GORDON:
Q. Have you gone through it at all?

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A. Well, I glanced through it, but it's fairly lengthy.
Q. Right. Do you have -- as you sit here today, do you have any reason to doubt the accuracy of any of the summaries?
A. No. And, you know, for me to actually verify all these things would take a bit of time, but it looks very accurate, and I know the people involved are conscientious.
Q. And in answer to your comment, yes, I do know, it would take a long time.
A. Uh-huh; uh-huh.
Q. I will so stipulate. Kearney and Decker were still representing Liggett in December of 1990; correct?
A. Yes, they have been active up to fairly recently.
MR. GORDON: Have this marked, please.
(Plaintiffs' Exhibit 1343 was marked for identification.)
THE COURT REPORTER: Thirteen forty-three.
BY MR. GORDON:
Q. I'm showing you what's been marked

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as Exhibit 1343, a single-page document produced in discovery by Liggett bearing payments number LG 2000001. There should be five zeros there.

A. Uh-huh.

Q. This is a letter from you to Francis Decker at Webster & Sheffield; right?

A. Correct, yes.

Q. And you're referencing a meeting that you had with Mr. Decker and Mr. Kearney on November 29, 1990?

A. That's correct, uh-huh.

Q. And you're enclosing there some minutes of that meeting that you had drafted; is that right?

A. Right, uh-huh.

MR. GORDON: Okay. Let's, if I may, have this next one marked.

(Plaintiffs' Exhibit 1344 was marked for identification.)

BY MR. GORDON:

Q. Showing you what's been marked as Exhibit 1344, a four-page document produced in discovery by Liggett bearing Bates number LG 2000002 through 005, memorandum dated December 5, 1990 from you to Roy C. Hilliard.

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A. Uh-huh.
Q. And the subject is minutes from meeting with Liggett's product liability lawyers, Francis K. Decker and James Kearney, Webster & Sheffield, on November 29, 1990?
A. Correct, I see it.
Q. And these would be the minutes that were -- that you sent to Decker for review; right?
A. That's correct, uh-huh.
Q. Who is Roy Hilliard?
A. Roy Hilliard was at that time the director of research.
Q. Okay. And according to these minutes, the purpose of your meeting with Mr. Kearney and Mr. Decker was to "Review the impact of past, present and future research on product liability efforts."
Do you see that?
A. Right, uh-huh.
Q. And in point number one, you state that "Mr. Kearney and Mr. Decker emphasized that tobacco research, including that involving Liggett, is intimately involved in the real-world of product litigation."
Do you see that?

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A. Right, uh-huh.
Q. A little bit further on down, it says, quote, "Because we are in a survival mode, it is important that we keep our research objectives sharply focused and that we are plugged into grass roots and scientific issues.
"Mr. Kearney further emphasized that we must be sensitive to the concept of privileged and confidential and that we apply it where warranted."
Do you see that?
A. I see it.
Q. What did you mean by "survival mode"?
A. Well, I started at Liggett in August 6th of 1990, and this was about four months later, and I think they came down -- I had had some discussions with them, to kind of open my eyes up to the fact that we were involved with research that wasn't just pure, really, academic, that we need to be focused on all these issues, and it was kind of like my introduction to research in the tobacco industry -- and I'm kind of losing focus here, but the actual question being --

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Q. What you meant by "survival mode"?
A. Well, there has been ongoing litigation for quite some time in this tobacco area, and Kearney and Decker have been dealing with this for a number of years, and I think they saw it this way and tried to convey that idea to me, that we really needed to be aware of outside activities and to be careful in our research not to go off on a tangent.
Q. And Kearney and Decker had come to North Carolina to meet with you; is that correct --
A. That's correct.
Q. -- from New York?
A. Right, uh-huh.
Q. And they came to talk in general about how research that Liggett was conducting might impact on product liability lawsuits; correct?
A. Correct, uh-huh.
Q. In all your work experience prior to your work in the cigarette industry, have you ever had a lawyer talk to you about how your research work might impact on lawsuits?
A. This was my introduction to that.

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I had never experienced that before, but my jobs were not really with industry other than the one in Wisconsin, where we were -- we had a little bit of confidentiality there because our studies were confidential, but this is the first time I ever had interaction with a lawyer.

Q. Would it be safe to say that part of their discussion was guidance from the lawyers as to what areas of research that Liggett should not be involved in?

A. Well, I think Liggett is a small company, and obviously, we don't do research in all these areas, and part of what they were talking about is "Don't worry about some of these areas, because it's ongoing. It's in the published literature, but when you do work, make sure it's focused and it has some relevance, and that" -- I think -- I don't think the lawyers ever directed our research, as such, they left that up to us.

Q. Well, let's turn to page 2, and let me ask you specifically about number F, letter F, research on the pharmacokinetics of nicotine in relation to addiction.

A. Uh-huh.

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Q. Do you see where they talk about this controversial area?
A. Right.
Q. And it is not likely that Liggett could add more to the plethora of data?
A. Uh-huh.
Q. Is it your understanding that they were suggesting that Liggett not conducting research into the pharmacokinetics to nicotine in relation to addiction?
A. Well, this was an area that they felt right with the -- in the government, as well as at the university level, there was a lot of research, actually some of the companies were openly publishing research in this area, and that with our limited budget, we could probably not really pay attention to this other than reading the literature.
Q. What was your understanding of why this was a controversial area?
A. Well, addiction, I think, is -- from a legal point of view, has a lot of impact, because it takes away the issue that people smoke of their own free will.
Q. On the next page, page 3, there's a

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reference to a 447 flavor modifier?
A. Uh-huh.
Q. What is that?
A. Four forty-seven is a distillation byproduct.
Q. What does that mean?
A. In the gasahol industry, it's my understanding that when they make ethyl alcohol from corn products, or it could be any grain, there's always a residue, and this residue is a natural ingredient, and you have these sorts of things in the beer industry with hops, and so on, and so there's a variety of these kind of residue products that are there. They are byproducts and can be thrown away, but somebody felt that -- that it has some utility in the area of flavors, and so there was a group of -- that Liggett was involved with that was trying to look into this in various context and, in fact, we did use 447.
Q. What -- what is the chemical makeup of 447?
A. Well, like I said, it's a natural product, and it's a distillation byproduct, so it's a variety of amino acids, protein, carbohydrates, so it's a "gamish" of materials

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that would be like any natural products, a mixture like even tobacco itself is a mixture of ingredients.

Q. It's a byproduct from the distillation of what?

A. Corn -- and I don't know exactly the process. I'm not -- I wasn't involved with it, but it was --

Q. Did it have any nicotine in it?

A. No.

Q. In the same page, page 4, there's a paragraph numbered four, and this summarizes a discussion you had with Mr. Decker and Mr. Kearney about interactions with other tobacco industry scientists; correct?

A. Uh-huh.

Q. And there was a suggestion that Liggett consider sending a legal representative to accompany scientists during visits to other tobacco industry laboratories.

Do you see that?

A. I see that, yes.

Q. What was your understanding of why they were suggesting considering sending a legal representative to accompany scientists to visit

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other tobacco industry laboratories?
A. It's been awhile since I wrote that in 1990, but it's my experience that you can attend meetings, and you may not appreciate that side of it, if you're purely looking at scientific, and that is perhaps the reason, but I don't know specifically.
Q. When you say "that side of it," you mean the product liability side?
A. Right, uh-huh.
Q. And was it your understanding that the suggestion was that lawyers come along with the scientists to make sure that the litigation concerns --
A. Uh-huh.
Q. -- are considered in any scientific discussions?
MR. DIESETH: Objection.
A. My experience, for the most part, has been that the lawyers try to stay out of those scientific discussions, but there were occasions when they would step up and say, "We're in an area we shouldn't be involved in in terms of" -- I don't know what the term would be, but where "collusion" might be a term or something where

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you're cooperating and it's outside the bounds of legal, so there have been occasions when lawyers have been in attendance in those kinds of meetings.

BY MR. GORDON:

Q. Was it your understanding that this --

A. Interstate -- I don't know the laws, but interstate commerce, different things that apply to some of these things.

Q. And antitrust implications?

A. Antitrust, and so on.

Q. But this discussion in Exhibit 1344 wasn't about antitrust, it was about product liability, right?

A. Right.

Q. And that would be true of this suggestion that lawyers accompany scientists to meetings with other industry scientists; right?

MR. MARKS: Objection.

A. They were making the suggestion apparently at this time.

BY MR. GORDON:

Q. Right. And that was in the context of discussion about products liability concern?

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A. Right, uh-huh.
Q. Let me just show this to you, and I won't mark it if it's not your handwriting, but I'm guessing it might go.
Is that your handwriting?
A. That is my handwriting.
MR. GORDON; Then I will mark it.
(Plaintiffs' Exhibit 1345 was marked for identification.)
BY MR. GORDON:
Q. I'm going to show you what's been marked as Exhibit 1345, a six-page document produced in discovery by Liggett bearing Bates number LG 2008151 through 8156. It's a series of handwritten notes, and this is your handwriting; is that correct?
A. That's correct, uh-huh.
Q. And I'm guessing from some of the subjects that appear to be discussed, 447, et cetera, that these notes might somehow relate to that meeting with Decker and Kearney?
A. Actually, not in this case. It was a discussion I had with Roy Hilliard.
Q. Roy Hilliard is director of research?

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A. Right, uh-huh.
Q. What time frame would this have been?
A. I don't know specifically. There doesn't seem to be a date on it, but I would imagine about 1990 would be early, when I was just becoming introduced to our company.
Q. Okay. Let me direct your attention to the fifth page.
A. Uh-huh.
Q. Do you see the top line there?
A. Right.
Q. What does that say?
A. "Addiction," and then there's a wavy line to "habit forming."
Q. What does that mean?
A. At the time, I was discussing various issues with Roy Hilliard, who is my boss, and he basically told me that the industry didn't look at cigarette smoking and tobacco as being addictive, that the prevailing point of view was that it's habit forming, based on the 1964 Surgeon General's report.
Q. If you turn to the next page, there's a line towards the bottom that looks like

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it says "addict," period, "should be habit forming."

Do you see that?

A. Where are we now?

Q. There is an arrow.

A. Okay. Where are we now -- "addictive, should be" -- right, uh-huh, saying it's -- maybe added a little more emphasis on that.

Q. In other words, don't say "addiction," say "habit forming"?

MR. DIESETH: Objection.

MR. MARKS: Objection.

A. Roy didn't instruct me that way, he was just saying that that's the position of industry.

BY MR. GORDON:

Q. That we don't say it's "addictive," we say it's "habit forming"?

A. Uh-huh.

Q. Go back to the page before, if you would --

A. Uh-huh.

Q. -- where it says, "nicotine reduction," I think?

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A. Right.
Q. What -- what does that say there?
A. "You know nicotine is addictive, why not reduce, ammonia and ethylene tied up nicotine, but still in smoke. Roy has been working on this."
Q. What does that --
A. Okay. Roy had a nicotine reduction file, and there was a time when, apparently, Liggett was working with ammonia, but it was primarily to reduce the nicotine in harsh-type tobaccos, and he let me have that file, and he said that it might be controversial because a lot of people think nicotine is addictive, but we, in fact, were lowering nicotine at the time, and we used ammonia and ethylene. I don't think they ever really went into production. There may have been patents on it.
Q. It is possible to remove nicotine from tobacco; correct?
A. That's my understanding, right. I've never done it, but from what I read, that is definitely possible.
Q. But denicotinized cigarettes don't sell, correct?

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A. That's correct.
Q. And nicotine is not a positive contributer to taste in a cigarette, is it?
MR. DIESETH: Objection.
A. Some of the old literature says that it is, but I think it's gotten away from that more recently and people would not say that today so much, but there are some of the old-timers would say that there is a taste associated there.
BY MR. GORDON:
Q. Have you heard any discussion of the concept of compensation?
A. Yes.
Q. What is your understanding of what that refers to in the context of cigarette smoking?
A. Should I wait?
Okay. I was distracted by the discussion.
"Compensation" is a phenomena that is -- supposedly, when you have low-nicotine cigarettes, low-nicotine, low-tar, the consumer will perhaps inhale more deeply, take greater puffs, perhaps close the vents and will compensate for the reduced nicotine tar delivery."
Q. Did Liggett ever do any studies to

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determine if that was an operative phenomenon?
A. Not to my knowledge, never saw anything like that.
Q. Okay. You were responsible for collecting Liggett's formula documents in connection with this litigation; is that right?
A. With the -- with the -- in terms of cigarette blends, I have done some of that, uh-huh.
Q. What did you do to gather these documents?
A. My input was primarily in the area of cigarette blend additives, like the ones that involved Covington & Burling, but we have things that relate to paper, filter and actual blend itself that were not necessarily my function, but those were coordinated through our library, and Sandy Harris -- Sandra Harris, as well as, she's primarily involved with information at Liggett.
Q. Did you determine if there were any gaps in the documents that Liggett had available to it for its formulas; in other words, was there anything missing, years or a cigarette or a particular --
A. To be honest with you, you have so

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much there -- there's filters, there's paper, there's blends, and all these kind of come together.

I reviewed mostly tobacco additives relative to flavorants, and we went through a process when we were requested by CDC to voluntarily provide nontobacco ingredients where I did review some of that, but it's pretty exhaustive, and I'm certainly -- it would take a long time to -- you would almost have to be dedicated to that, and I'm just -- with -- relative to our staff to actually go through and methodically check every single thing, you'd have to have some focus on a particular product, a particular year or some kind of a reference point.

Q. Did Liggett produce in this litigation documents related to nonflavor additives to filters and papers?

A. Relative to what; to litigation or relative to CDC or --

Q. Well, you'd indicated that you gathered some of this information for the CDC.

A. Right, uh-huh.

Q. My question was whether you produced the same or similar information in this

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litigation?
A. I don't know. Specifically, oftentimes, Roy Hilliard would be doing that, so I don't really know.
Q. So, whether Liggett produced documents related to nonflavorant additives to filters or not, you just don't know?
A. I wouldn't know, because there was multiple people working on this, and it would depend on the particular case, and so on.
Q. Did Liggett ever use computers in the design of cigarettes?
A. I think there was a program going on with regard to filters at one time, and I don't know whether that's currently in progress or not.
Q. Who would know about that?
A. We have a person who really looks into specifications with regard to filters and paper, Cliff Detweiler, who is no longer with the company, but he is a consultant now, and he was working in conjunction with one of our vendors along that line.
Q. Which vendor is that?
A. I believe it -- well, I'm not absolutely certain, but it may have been Eastman,

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Tennessee, filter.

Q. Would you agree that it would be improper for a cigarette company to chemically alter its cigarette to make it more addictive?

MR. MARKS: Objection to form.

MR. DIESETH: Objection.

A. I guess if you accept the premise of addiction, perhaps. It depends. The seriousness of that is hard for me to grasp, but I don't think I can say that we were ever in the business of really trying to really modify nicotine at Liggett, but, you know, it was not -- I think it would -- when I really sort of search around for your answer, I would say probably, it would not be something we should do, but I have never really had to deal with that question.

BY MR. GORDON:

Q. At Liggett?

A. Right.

MR. GORDON: Give me one moment, please.

(Pause)

Thanks. I have nothing further on your topic areas.

MR. MARKS: You guys have any

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questions?

Take a one-minute break?

MR. GORDON: Sure.

(Recess taken.)

MR. MARKS: I have no questions.

(Deposition recessed at 11:45 o'clock a.m.)

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C E R T I F I C A T E

I, Sue A. Terry, RPR/CRR, hereby certify that I am qualified as a verbatim shorthand reporter; that I took in stenographic shorthand the testimony of Liggett Group (DENNIS D. DIETZ) at the time and place aforesaid; and that the foregoing transcript is a true and correct, full and complete transcription of said shorthand notes, to the best of my ability.

Dated at New York, New York, this 29th day of September, 1997.

_____

SUE A. TERRY, RPR/CRR

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I N D E X

EXHIBITS	DESCRIPTION	MARKED
Plfs. Ex. 1335	Liggett Research Document, Bates LG 0262125-26	27
Plfs. Ex. 1336	Document, Bates LG0262127-29, "Development of a Cigarette with Increased Smoke pH"	39
Plfs. Ex. 1337	Memorandum, "Modification of Smoke pH," Bates LG 0262509-12	45
Plfs. Ex. 1338	Document, "History of Expanded Tobacco Casing Formulation," Bates LG 2010420	82
Plfs. Ex. 1339	Memorandum, Dietz to Miller, 5-15-92, Bates LG 2018502	85
Plfs. Ex. 1340	Memorandum, Dietz to Murray, Totty and Sulin, Bates LG 2018558	89
Plfs. Ex. 1341	Memorandum, Dietz to Sulin, 7-26-93, Bates LG 0299076-92	91
Plfs. Ex. 1342	Document, "Master List of Cigarette Additives and Production Changes, Bates LG 2013303-3440	104

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Plfs. Ex. 1343	Document, Letter from Dietz to Decker, LG 2000001	107
Plfs. Ex. 1344	Memorandum, 12-5-90, Dietz to Hilliard, Bates LG 2000002-05	108
Plfs. Ex. 1345	Handwritten Notes of Dietz, Bates LG2008151-156	118

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